Adilkhan Salkimbayev

Applied Mathematics & Scientific Machine Learning Researcher
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TECHNICAL SUMMARY

Undergraduate researcher in nonlinear control systems and scientific machine learning. Experience in adaptive control, Lyapunov stability analysis, and learning-based controllers for nonlinear dynamical systems. Author of research on Kolmogorov-Arnold Networks for embedded control applications. Interested in control engineering, robotics, and data-driven dynamical systems modeling.

RESEARCH PROJECTS

Robust Adaptive Kolmogorov-Arnold Neural Control **Jan 2026 – Apr 2026**
Single-author research project

- Developed adaptive control architecture combining Recursive Least Squares and symbolic KAN models
- Derived Lyapunov stability guarantees (ISS / GUUB) using LaSalle-Yoshizawa arguments for nonlinear system regulation
- Evaluated performance on quadruple-tank benchmark system in Python simulations; 5x decreased runtime and 5x reduced Total Variation of input
- Research paper in revision

Constant-Time Neural Control for Non-Minimum Phase Systems **Nov 2025 – Apr 2026**
Single-author research project

- Proposed symbolic KAN architecture as an alternative to Linear Time-Varying MPC
- Designed controller for embedded systems with strict computational constraints
- Evaluated performance on quadruple-tank benchmark using Hardware-in-the-Loop (HIL) methodology on STM32H7; reduction of runtime by up to 5 orders of magnitude (OOM)
- Submitted research paper to Engineering Applications of Artificial Intelligence journal

TECHNICAL SKILLS

Programming: Python (NumPy, SciPy, matplotlib, python-control), C

Control Systems:
MPC, adaptive control, nonlinear control, Lyapunov stability analysis

Scientific Machine Learning:
Kolmogorov-Arnold Networks, system identification, training methodologies

Industrial & Simulation Tools:
MATLAB/Simulink, PLC systems (Schneider M241, M340, Control Expert), pandas

EDUCATION

Kazakh-British Technical University (KBTU) **Aug 2023 – July 2027**
Automation and Control, BSc; GPA 3.59

ACHIEVEMENTS

- Author of two control systems research papers (EAAI submission, revised Robust Adaptive Kolmogorov-Arnold Neural Control manuscript)
- Independent research in nonlinear adaptive control and scientific machine learning
- Experience with PLC-based industrial automation systems
- Experience with embedded C programming and machine learning frameworks